DI / SDI DX AHU Control Panel
Installation manual

Outdoor Unit

For Commercial Use

Model name: RAV Digital Inverter and Digital Super Inverter

SM564ATP-E
SM804ATP-E
SM1104ATP-E
SM1404ATP-E
SM1603AT-E

SP404ATP-E
SP564ATP-E
SP804ATP-E
SP1104AT-E
SP1404AT-E
SP1604AT-E
SP1104AT8-E
SP1404AT8-E
SP1604AT8-E

Installation Manual

RBC-AHU1

Please read this Installation Manual carefully before installing the Control Panel.

- This Manual describes the installation method of the Control Panel.
- You must also refer to the Installation and Owner's Manual attached to the Toshiba outdoor unit.
- Please follow the manual(s) for your Air Handling Unit (local supply).
- Toshiba Carrier UK (Ltd) does not take any responsibility on the local design.

ADOPTION OF NEW REFRIGERANT

This Air Conditioner is a new type which adopts a new refrigerant HFC (R410A) instead of the conventional refrigerant R22 in order to prevent destruction of the ozone layer.

This appliance is for commercial use only and should not be accessible to the general public.

This appliance is not intended for use by person (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

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This symbol mark is for EU countries only.
This symbol mark is according to the directive 2002/96/EC Article 10 Information for users and Annex IV.
This product is designed and manufactured with high quality materials and components which can be recycled and reused.
This symbol means that electrical and electronic equipment, at the end-of-life, should be disposed of separately from your household waste.
Please dispose of this equipment at your local community waste collection / recycling centre.
In the European Union there are separate collection systems for used electrical and electronic product.

Thank you for purchasing this Toshiba air conditioner.
Please read carefully through these instructions that contain important information which complies with the “Machinery” Directive (Directive 2006/42/EC), and ensure that you understand them.
After reading these instructions, be sure to keep them in a safe place together with the Owner’s Manual and Installation Manual supplied with your product.

Generic Denomination: Air Conditioner

Definition of Qualified Installer or Qualified Service Person

The air conditioner must be installed, maintained, repaired and removed by a qualified installer or qualified service person. When any of these jobs is to be done, ask a qualified installer or qualified service person to do them for you.
A qualified installer or qualified service person is an agent who has the qualifications and knowledge described in the table below.

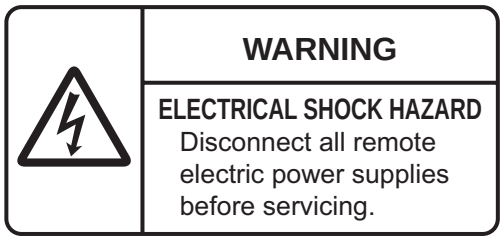
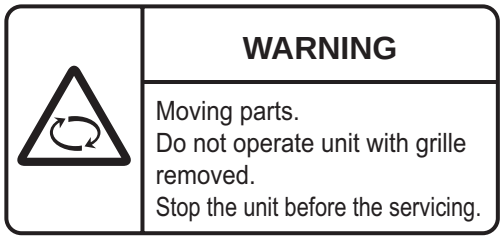
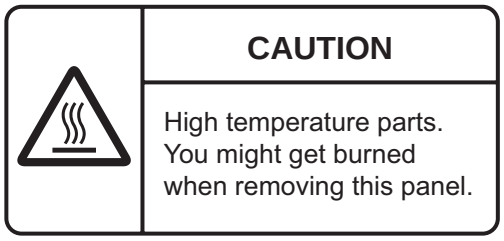
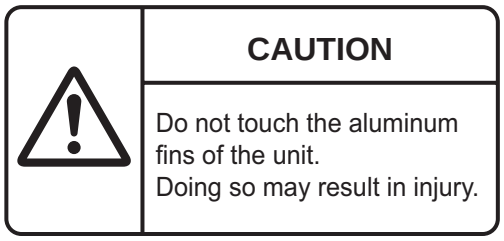
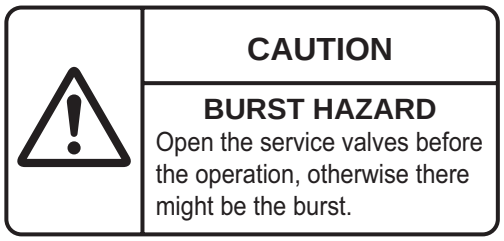
Agent	Qualifications and knowledge which the agent must have
Qualified installer	• The qualified installer is a person who installs, maintains, relocates and removes the air conditioners made by Toshiba Carrier Corporation. He or she has been trained to install, maintain, relocate and remove the air conditioners made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such operations by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to these operations. • The qualified installer who is allowed to do the electrical work involved in installation, relocation and removal has the qualifications pertaining to this electrical work as stipulated by the local laws and regulations, and he or she is a person who has been trained in matters relating to electrical work on the air conditioners made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work. • The qualified installer who is allowed to do the refrigerant handling and piping work involved in installation, relocation and removal has the qualifications pertaining to this refrigerant handling and piping work as stipulated by the local laws and regulations, and he or she is a person who has been trained in matters relating to refrigerant handling and piping work on the air conditioners made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work. • The qualified installer who is allowed to work at heights has been trained in matters relating to working at heights with the air conditioners made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work.
Qualified service person	• The qualified service person is a person who installs, repairs, maintains, relocates and removes the air conditioners made by Toshiba Carrier Corporation. He or she has been trained to install, repair, maintain, relocate and remove the air conditioners made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such operations by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to these operations. • The qualified service person who is allowed to do the electrical work involved in installation, repair, relocation and removal has the qualifications pertaining to this electrical work as stipulated by the local laws and regulations, and he or she is a person who has been trained in matters relating to electrical work on the air conditioners made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work. • The qualified service person who is allowed to do the refrigerant handling and piping work involved in installation, repair, relocation and removal has the qualifications pertaining to this refrigerant handling and piping work as stipulated by the local laws and regulations, and he or she is a person who has been trained in matters relating to refrigerant handling and piping work on the air conditioners made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work. • The qualified service person who is allowed to work at heights has been trained in matters relating to working at heights with the air conditioners made by Toshiba Carrier Corporation or, alternatively, he or she has been instructed in such matters by an individual or individuals who have been trained and is thus thoroughly acquainted with the knowledge related to this work.

Definition of Protective Gear

When the air conditioner is to be transported, installed, maintained, repaired or removed, wear protective gloves and “safety” work clothing.
In addition to such normal protective gear, wear the protective gear described below when undertaking the special work detailed in the table below.
Failure to wear the proper protective gear is dangerous because you will be more susceptible to injury, burns, electric shocks and other injuries.

Work undertaken	Protective gear worn
All types of work	Protective gloves “Safety” working clothing
Electrical-related work	Gloves to provide protection for electricians and from heat Insulating shoes Clothing to provide protection from electric shock
Work done at heights (50 cm or more)	Helmets for use in industry
Transportation of heavy objects	Shoes with additional protective toe cap
Repair of outdoor unit	Gloves to provide protection for electricians and from heat

■ Warning Indications on the Air Conditioner Unit

Warning indication	Description
	**WARNING** **ELECTRICAL SHOCK HAZARD** Disconnect all remote electric power supplies before servicing.
	**WARNING** **Moving parts.** Do not operate unit with grille removed. Stop the unit before the servicing.
	**CAUTION** High temperature parts. You might get burned when removing this panel.
	**CAUTION** Do not touch the aluminum fins of the unit. Doing so may result in injury.
	**CAUTION** **BURST HAZARD** Open the service valves before the operation, otherwise there might be the burst.

1 ELECTRICAL WORK

⚠ WARNING

1. **Using the specified wires, ensure to connect the wires, and fix wires securely so that the external tension to the wires do not affect the connecting part of the terminals.**
   Incomplete connection or fixation may cause a fire, etc.
2. **Be sure to connect earth wire. (grounding work)**
   Incomplete grounding cause an electric shock. Do not connect ground wires to gas pipes, water pipes, lightning rods or ground wires for telephone wires.
3. **Appliance shall be installed in accordance with national wiring regulations.**
   Capacity shortage of power circuit or incomplete installation may cause an electric shock or a fire.

⚠ CAUTION

- If incorrect/incomplete wiring is carried out, it will cause an electrical fire or smoke.
- Be sure to install an earth leakage breaker that is not tripped by shock waves.
  If an earth leakage breaker is not installed, an electric shock may be caused.
- Be sure to use the cord clamps attached to the product.
- Do not damage or scratch the conductive core and inner insulator of power and inter-connecting wires when peeling them.
- Use the power cord and Inter-connecting wire of specified thickness, type, and protective devices required.
- Never connect 220-240V power to the terminal blocks (A , B etc.) for control wiring. (Otherwise, the system will fail.)

REQUIREMENT

- For power supply wiring, strictly conform to the Local Regulation in each country.
- For wiring of power supply of the outdoor units, follow the Installation Manual of each outdoor unit.
- Perform the electric wiring so that it does not come to contact with the high-temperature part of the pipe. The coating may melt resulting in an accident.
- After connecting wires to the terminal blocks, provide a trap and fix wires with the cord clamp.
- Run the refrigerant piping line and control wiring line in the same line.
- Do not turn on the power of the indoor unit until vacuuming of the refrigerant pipes completes.

■ Power supply wire and communication wires specifications

Power supply wire and communication wires are procured locally.
For the power supply specifications, follow to the table below. If capacity is little, it is dangerous because overheat or seizure may be caused. For specifications of the power capacity of the outdoor unit and the power supply wires, refer to the Installation Manual attached to the outdoor unit.

Indoor unit power supply

- For the power supply of the indoor unit, prepare the exclusive power supply separated from that of the outdoor unit.
- Arrange the power supply, earth leakage breaker, and main switch of the indoor unit connected to the same outdoor unit so that they are commonly used.
- Power supply wire specification : Cable 3-core 2.5mm^2, **in conformity with Design 60245 IEC 57.**

▼ Power supply

Power supply	220-240V —, 50Hz	
Power supply switch/Earth leakage breaker or power supply wiring/fuse rating for indoor units should be selected by the accummulated total current values of the indoor units.		
Power supply wiring	Below 50m	2.5 mm^2

Control wiring, Central controller wiring

- 2-core with polarity wires are used for the Control wiring between indoor unit and outdoor unit and Central controller wiring.
- To prevent noise trouble, use 2-core shield wire,
- The length of the communication line means the total length of the inter-unit wire length between indoor and outdoor units added with the central control system wire length

2 PRECAUTIONS FOR SAFETY

The manufacturer shall not assume any liability for the damage caused by not observing the description of this manual.

⚠ WARNING

General

- Before starting to install the air conditioner, read carefully through the Installation Manual, and follow its instructions to install the air conditioner.
- Only a qualified installer(*1) or qualified service person(*1) is allowed to install the air conditioner. If the air conditioner is installed by an unqualified individual, a fire, electric shocks, injury, water leakage, noise and/or vibration may result.
- Do not use any refrigerant different from the one specified for complement or replacement. Otherwise, abnormally high pressure may be generated in the refrigeration cycle, which may result in a failure or explosion of the product or an injury to your body.
- When transporting the air conditioner, use a forklift and when moving the air conditioner by hand, move the unit with 4 people.
- Before opening the intake grille of the indoor unit or service panel of the outdoor unit, set the circuit breaker to the OFF position. Failure to set the circuit breaker to the OFF position may result in electric shocks through contact with the interior parts. Only a qualified installer(*1) or qualified service person(*1) is allowed to remove the intake grille of the indoor unit or service panel of the outdoor unit and do the work required.
- Before carrying out the installation, maintenance, repair or removal work, be sure to set the circuit breaker to the OFF position. Otherwise, electric shocks may result.
- Place a “Work in progress” sign near the circuit breaker while the installation, maintenance, repair or removal work is being carried out. There is a danger of electric shocks if the circuit breaker is set to ON by mistake.
- Only a qualified installer(*1) or qualified service person(*1) is allowed to undertake work at heights using a stand of 50 cm or more.
- Wear protective gloves and safety work clothing during installation, servicing and removal.
- Do not touch the aluminum fin of the outdoor unit. You may injure yourself if you do so. If the fin must be touched for some reason, first put on protective gloves and safety work clothing, and then proceed.
- Do not climb onto or place objects on top of the outdoor unit. You may fall or the objects may fall off of the outdoor unit and result in injury.
- When working at heights, use a ladder which complies with the ISO 14122 standard, and follow the procedure in the ladder’s instructions. Also wear a helmet for use in industry as protective gear to undertake the work.
- When cleaning the filter or other parts of the outdoor unit, set the circuit breaker to OFF without fail, and place a “Work in progress” sign near the circuit breaker before proceeding with the work.
- When working at heights, put a sign in place so that no-one will approach the work location, before proceeding with the work. Parts and other objects may fall from above, possibly injuring a person below.
- The refrigerant used by this air conditioner is the R410A.
- You shall ensure that the air conditioner is transported in stable condition.
- Do not modify the products. Do not also disassemble or modify the parts. It may cause a fire, electric shock or injury.

Selection of installation location

- If you install the unit in a small room, take appropriate measures to prevent the refrigerant from exceeding the limit concentration even if it leaks. Consult the dealer from whom you purchased the air conditioner when you implement the measures. Accumulation of highly concentrated refrigerant may cause an oxygen deficiency accident.
- Do not install the air conditioner in a location that may be subject to a risk of expire to a combustible gas. If a combustible gas leaks and becomes concentrated around the unit, a fire may occur.
- When transporting the air conditioner, wear shoes with additional protective toe caps.
- When transporting the air conditioner, do not take hold of the bands around the packing carton. You may injure yourself if the bands should break.
- Do not place any combustion appliance in a place where it is directly exposed to the wind of air conditioner, otherwise it may cause imperfect combustion.

2 PRECAUTIONS FOR SAFETY

- Ensure that all Local, National and International regulations are satisfied.
- Read this "PRECAUTIONS FOR SAFETY" carefully before Installation.
- The precautions described below include the important items regarding safety. Observe them without fail.
- After the installation work, perform a trial operation to check for any problem.
  Follow the Owner's Manual to explain how to use and maintain the unit to the customer.
- Turn off the main power supply switch (or breaker) before the unit maintenance.
- Ask the customer to keep the Installation Manual.

CAUTION **New Refrigerant Air Conditioner Installation**

- **THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT (R410A) WHICH DOES NOT DESTROY OZONE LAYER.**

The characteristics of R410A refrigerant are ; easy to absorb water, oxidizing membrane or oil, and its pressure is approx. 1.6 times higher than that of refrigerant R22. Accompanied with the new refrigerant, refrigerating oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigerating oil does not enter the refrigerating cycle.

To prevent charging an incorrect refrigerant and refrigerating oil, the sizes of connecting sections of charging port of the main unit and installation tools are charged from those for the conventional refrigerant.

Accordingly the exclusive tools are required for the new refrigerant (R410A).

For connecting pipes, use new and clean piping designed for R410A, and please care so that water or dust does not enter. Moreover, do not use the existing piping because there are problems with pressure-resistance force and impurity in it.

CAUTION **To Disconnect the Appliance from Main Power Supply.**

This appliance must be connected to the main power supply by means of a switch with a contact separation of at least 3 mm.

1 SUPPLIED PARTS

The RBC-AHU Control Panel is designed to allow the connection of a third party air handling unit (with R410A DX Coil) to a Toshiba DI/SDI outdoor unit (RAV-SM Digital Inverter and RAV-SP Super Digital Inverter).

The components consists of a Control Panel, two coil sensors, one return air sensor, one fixed sensor (resistor) and coil sensor fixing kit.

Item	Description	QTY
	TCJ (TC1) Sensor (Coil Sensor)	
	TC (TC2) Sensor (Coil Sensor)	
	TA Sensor (Return Air or Sensing)	
	Sensor Fixing Kit	

3 OVERVIEW

The minimum 'air on' temperature that Toshiba recommend for our AHU applications is 15°C Cooling, 12ÁC Heating

Cooling Mode

Air temperatures flowing across the coil below this level, can in some circumstances, cause icing and freezing issues with the coil and eventually forcing the system to shut down and also be detrimental to the outdoor unit itself.

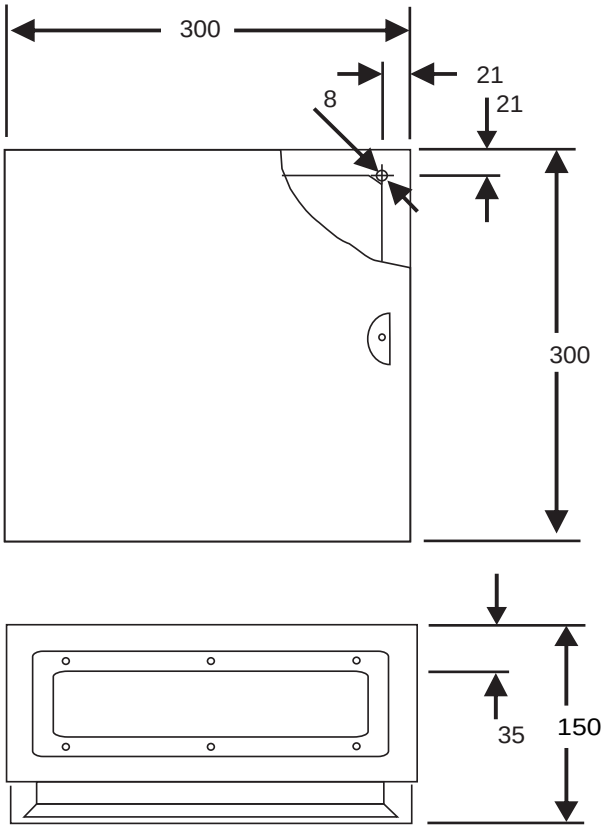
Heating Mode

In the reverse cycle mode when the outdoor unit is producing hot gas, the coil in the AHU is effectively the condenser. Air temperatures flowing across the coil below this level, can cause over condensing of the refrigerant. This can result in liquid being returned to the compressor which will cause a mechanical failure of the outdoor unit. Low air temperatures will also cause the unit to use it's defrost mode more often.

We cannot guarantee operation of the systems for applications with 'air on' temperatures below stated figures or with coil details outside of those published in the installation manual. Operation outside of these parameters may invalidate your warranty.

The control panel is designed to allow the connection of a third party air handling unit to a Toshiba Digital Inverter / Super Digital Inverter outdoor unit.

Kit contents: Control Panel, 2 x Coil Sensors (TC & TCJ), 1 x Return Air Sensor (TA), 1 x Fixed TA Sensor (resistor) & 1 x Coil Sensor Fixing Kit



CHARACTERISTICS
* Enclosure and door manufactured from 1.5 mm sheet steel
* Flat mounting plate manufactured from 2.5 mm
* Rating IP55

PAINT FINISH
* Eta standard cycle thermosetting epoxypolyester powder coating
* Enclosure and door RAL 7035 textured finish

All dimensions in mm.

4 INSTALLING CONTROL PANEL

The controller is designed for two mounting options.

Option 1

The controller is contained in a weather proof enclosure, which facilitates mounted on or close to the AHU. The cables should be glanded through the removable plate on the base of the controller to maintain waterproof integrity.

Option 2

Should there be a requirement to install the controller in a third party panel, it is possible to remove the base plate from the enclosure.

Electrical Connections

The controller is connected to the outdoor unit via a three core and earth interconnecting cable. The control option is selected depending upon the wider AHU control strategy. A wiring diagram showing the connection and control options is shown on page 6

5 INSTALLING THE SENSORS

Coil Sensor Locations

There are two coil sensors, which require attaching to the AHU coil. It is essential that the sensors are correctly located to ensure efficient system performance.

TCJ (TC1) Sensor

This sensor is fitted to the coil inlet pipe (liquid). Please see the picture below.

TC (TC2) Sensor

This sensor should be installed approximately two thirds of the way through the coil.

Fitting the Coils sensors I

It is essential that the sensors are securely attached and insulated to give best system performance.

1. Fix to pipe or U bend with two cable ties

2.Fit the insulation over the sensor

6 AIR TEMPERATURE SENSING OPTIONS

Return Air or Temperature Sensing Options

Several temperature sensing options are available.

Fixed TA Sensor (resistor)

A fixed resistance can be used, which will allow maximum system operation on receipt of an enable signal.

Actual TA Sensor

A Standard TA sensor could be used as the temperature control point for the AHU Control Panel in this case the TA sensor should be placed in the return air duct.

Secure this sensor using the supplied plastic clamp. It must be located in the Return Air Flow (Prior to mixing with any fresh air). Ensure that the Resin Sensor bulb is not covered by the protective vinyl-tube.

Remote Sensor

The remote temperature sensing kit TCB-TC21LE2 is fully compatible with the controller and should be mounted in conditioned space.

Remote Controller Sensor

It is also possible to configure the system to use the temperature sensor located in the RBC-AMT32E / AMS41E remote controllers.

7 WIRED CONTROLLER

1. **IMPORTANT**
   It is necessary to connect a Toshiba wired controller (option supplied separately), TCC-Net control or third party controller to terminals RC A+B on RBC-AHU1 to operate the system. RBC-AHU1 will not operate if this connection is not made. It is also necessary to connect a Toshiba wired controller to configure the DN address code settings for Toshiba Digital and Super Digital condensing units.
2. Standard Toshiba RBC-AMT32E / AMS41E controllers are compatible.
3. Remote enable signal from a third party source. Operation and fault signals can also be obtained as standard from the control panel.
4. Advanced control options are available on contact with Toshiba Technical Support

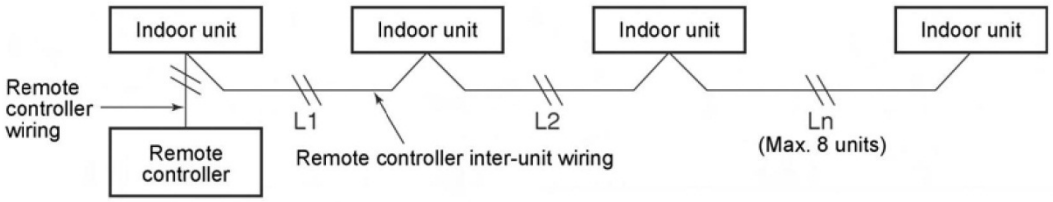
Remote controller wiring

- 2-core with non-polarity wire is used for wiring of the remote controller wiring and group remote controllers wiring.

Remote controller wiring, remote controller inter-unit wiring	Wire size: 0.5mm² to 2.0mm²	
Total wire length of remote controller wiring and remote controller inter-unit wiring = L + L1 + L2 + … Ln	In case of wired type only	Up to 500m
	In case of wireless type included	Up to 400m
Total wire length of remote controller inter-unit wiring = L1 + L2 + … Ln		Up to 200m

⚠ CAUTION

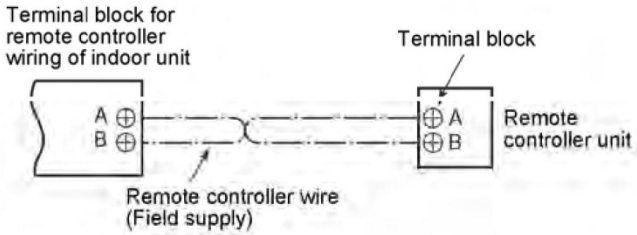
The remote controller wire (Communication line) and AC220–240V wires cannot be parallel to contact each other and cannot be stored in the same conduits. If doing so, a trouble may be caused on the control system due to noise, etc.



■ Remote controller wiring

- As the remote controller wire has non-polarity, there is no problem if connections to indoor unit terminal blocks A and B are reversed.

▼ Wiring diagram



8 CONTROL OPTIONS

TOSHIBA OUTDOOR

REFRIGERANT PIPE WORK CONNECTING OUTDOOR UNIT TO AHU PIPE WORK (SEE DATA TABLES FOR LIMITS)

ROOM AIR TEMPERATURE SENSOR (OPTION)

AIR HANDLING UNIT WITH REFRIGERANT DX COIL (R410A)

TOSHIBA HARD WIRED CONTROLLER (OPTION)

TOSHIBA AIR HANDLING UNIT CONTROL KIT

RBC-AHU1

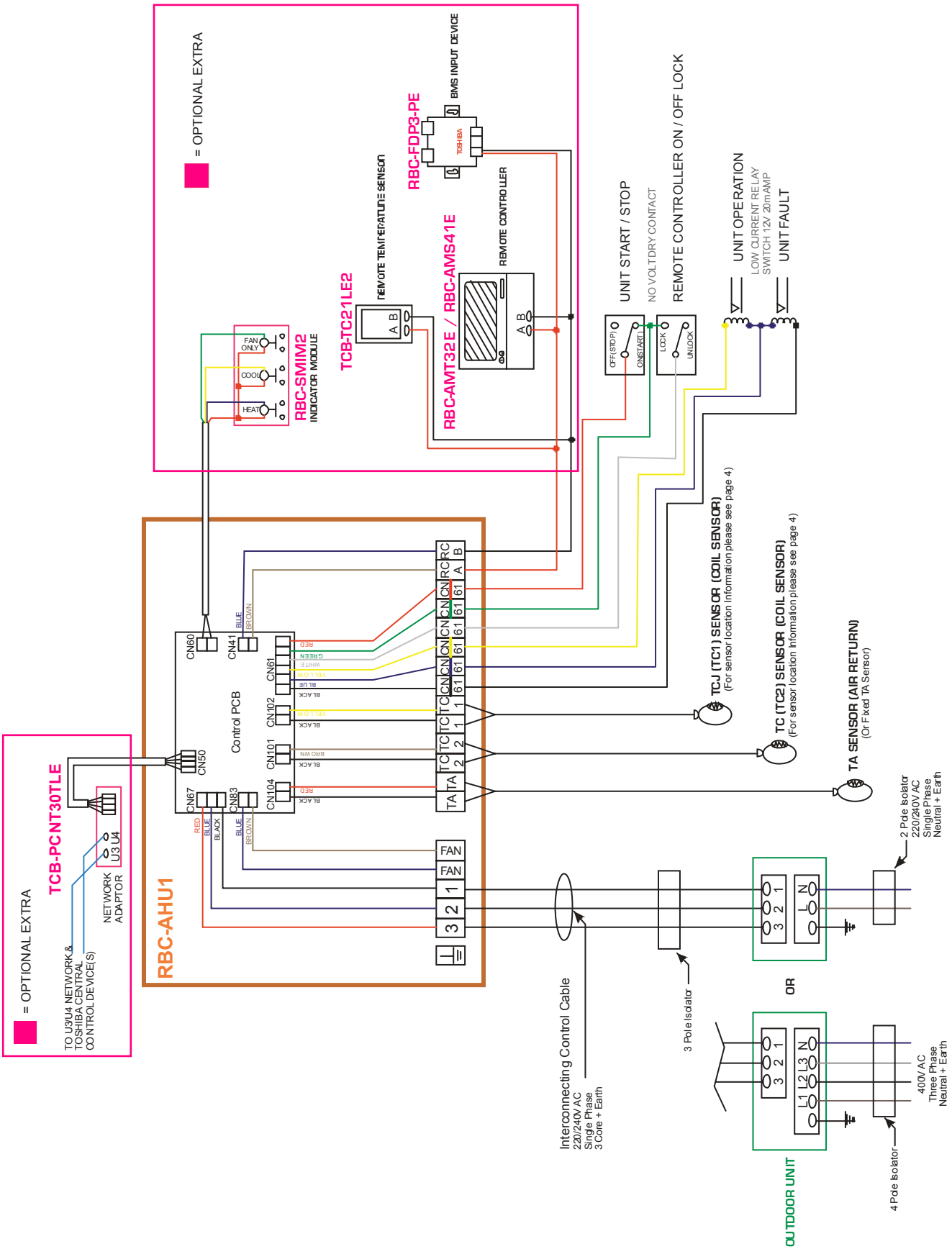
OPTIONS

WEEKLY SCHEDULE TIMER (available RBC-AMS41-E)
TCB-PCNT30TLE TOSHIBA TCC LINK NETWORK INTERFACE

STANDARD FEATURE

REMOTE ON / OFF (VOLT FREE)
REMOTE FAULT / RUN OUTPUT (12V DC 20mAMP)

9 WIRING DIAGRAM



10 PERFORMANCE SPECIFICATIONS

Digital Inverter Heat Pumps

Model	RAV Digital		SM564ATP-E	SM804ATP-E	SM1104ATP-E	SM1404ATP-E
System Data	Cooling Capacity	(kW)	1.5 - 5.6	1.5 - 8.0	3.0 - 11.2	3.0 - 13.2
	Heating Capacity	(kW)	1.5 - 6.3	1.5 - 9.0	3.0 - 13.0	3.0 - 16.0
	HEX Air Volume	(m3/hr)	480 - 1100	700 - 1500	1260 - 2500	1260 – 2750
	HEX Coil Volume	(cm3)	500 - 1500	800 - 2400	1000 - 3000	1250 – 3750
	HEX Coil Diameter	(mm / in)	9.52 (3/8)	9.52 (3/8)	9.52 (3/8)	9.52 (3/8)
	HEX Paths	(No.)	4 - 6	6 – 8	6 - 10	8 - 12
	Piping Limits Min. - Max.	(m)	5 - 30	5 – 30	5 - 50	5 - 50
	Pipe Diameter Gas/ Liquid	(mm)	12.7 / 6.4	15.9 / 9.5	15.9 / 9.5	15.9 / 9.5
	Refrigerant		R410A	R410A	R410A	R410A
	Refrigerant Base Charge	(kg)	1.1	1.7	2.8	2.8
	Charge-less Length	(m)	20	20	30	30
	Additional Charge	(g/m)	20	40	40	40
	Replacement Technology		YES	YES	YES	YES
	Air Flow	(m3/h)	2400	2700	4080	4200
	Sound Pressure Cool / Heat	(dBA)	46 / 48	48 / 52	53 / 54	54 / 55
	Dimensions Height x Width x Depth	(mm)	550 x 780 x 290	550 x 780 x 290	890 x 900 x 320	890 x 900 x 320
	Weight	(kg)	40	44	68	68
	Run Current	(Amps)	8.95	11.43	15.18	21.37
	Power Supply		16 Amps	16 Amps	20 Amps	32 Amps
	Suggested Fused Supply		1 phase 230v 50Hz	1 phase 230v 50Hz	1 phase 230v 50Hz	1 phase 230v 50Hz

Model	RAV Digital		SM1603AT-E	SM2244AT8-E	SM2804AT8-E
System Data	Cooling Capacity	(kW)	3.0 - 16.0	9.8 - 22.4	9.8 - 27.0
	Heating Capacity	(kW)	3.0 - 16.0	9.8 - 25.0	9.8 - 31.5
	HEX Air Volume	(m3/hr)	1260 - 3000	2880 - 4320	3360 - 5040
	HEX Coil Volume	(cm3)	1400 - 4200	2000 - 6000	2500 - 7500
	HEX Coil Diameter	(mm / in)	9.52 (3/8)	9.52 (3/8)	9.52 (3/8)
	HEX Paths	(No.)	8 - 12	10 - 12	10 - 12
	Piping Limits Min. - Max.	(m)	5 - 50	5 - 75	5 - 75
	Pipe Diameter Gas/ Liquid	(mm)	15.9 / 9.5	*28.6 / 12.7	*28.6 / 12.7
	Refrigerant		R410A	R410A	R410A
	Refrigerant Base Charge	(kg)	3.1	5.9	5.9
	Charge-less Length	(m)	30	30	30
	Additional Charge	(g/m)	40	80	80
	Replacement Technology		YES	YES	YES
	Air Flow	(m3/h)	6180	7980	7980
	Sound Pressure Cool / Heat	(dBA)	51 / 53	56 / 57	57 / 58
	Dimensions Height x Width x Depth	(mm)	1340 x 900 x 320	1540 x 900 x 320	1540 x 900 x 320
	Weight	(kg)	99	134	134
	Run Current	(Amps)	21.7	13.33	15.83
	Power Supply		1 phase 230v 50Hz	3 phase 400v 50Hz	3 phase 400v 50Hz
	Suggested Fused Supply		32	16	20

10 PERFORMANCE SPECIFICATIONS

Super Digital Inverter Heat Pumps

Model	RAV Digital		SP404AT-E	SP564ATP-E	SP804ATP-E	SP1104AT-E
System Data	Cooling Capacity	(kW)	1.5 - 4.0	1.2 - 5.6	1.9 - 8.0	2.6 - 12.0
	Heating Capacity	(kW)	1.5 - 5.0	0.9 - 8.1	1.3 - 11.3	2.4 - 13.0
	HEX Air Volume	(m3/hr)	480 - 880	480 - 1100	700 - 1500	1260 - 2500
	HEX Coil Volume	(cm3)	350 - 1050	500 - 1500	800 - 2400	1000 - 3000
	HEX Coil Diameter	(mm / in)	9.52 (3/8)	9.52 (3/8)	9.52 (3/8)	9.52 (3/8)
	HEX Paths	(No.)	4	4 - 6	6 - 8	6 - 10
	Piping Limits Min. - Max.	(m)	5 - 50	5 - 50	5 - 50	3 - 75
	Pipe Diameter Gas/ Liquid	(mm)	12.7 / 6.4	12.7 / 6.4	15.9 / 9.5	15.9 / 9.5
	Refrigerant		R410A	R410A	R410A	R410A
	Refrigerant Base Charge	(kg)	1	1.4	2.1	3.1
	Charge-less Length	(m)	20	20	30	30
	Additional Charge	(g/m)	20	20	40	40
	Replacement Technology		YES	YES	YES	YES
	Air Flow	(m3/h)	2400	2400	3000	6060
	Sound Pressure Cool / Heat	(dBA)	45 / 47	47 / 48	48 / 49	49 / 50
	Dimensions Height x Width x Depth	(mm)	550 x 780 x 290	550 x 780 x 290	890 x 900 x 320	1340 x 900 x 320
	Weight	(kg)	40	44	66	93
	Run Current	(Amps)	4.98	6.55	9.02	10.43
	Power Supply		1 phase 230v 50Hz	1 phase 230v 50Hz	1 phase 230v 50Hz	1 phase 230v 50Hz
	Suggested Fused Supply		10	16	16	16

Model	RAV Digital		SP1104AT8-E	SP1404AT-E	SP1404AT8-E	SP1604AT8-E
System Data	Cooling Capacity	(kW)	2.6 - 12.0	2.6 - 14.0	2.6 - 14.0	2.6 - 16.0
	Heating Capacity	(kW)	2.4 - 13.0	2.4 - 16.5	2.4 - 16.5	2.4 - 19.0
	HEX Air Volume	(m3/hr)	1260 - 2500	1260 - 2750	1260 - 2750	1260 - 3000
	HEX Coil Volume	(cm3)	1000 - 3000	1250 - 3750	1250 - 3750	1400 - 4200
	HEX Coil Diameter	(mm / in)	9.52 (3/8)	9.52 (3/8)	9.52 (3/8)	9.52 (3/8)
	HEX Paths	(No.)	6 - 10	8 - 12	8 - 12	8 - 12
	Piping Limits Min. - Max.	(m)	3 - 75	3 - 75	3 - 75	3 - 75
	Pipe Diameter Gas/ Liquid	(mm)	15.9 / 9.5	15.9 / 9.5	15.9 / 9.5	15.9 / 9.5
	Refrigerant		R410A	R410A	R410A	R410A
	Refrigerant Base Charge	(kg)	3.1	3.1	3.1	3.1
	Charge-less Length	(m)	30	30	30	30
	Additional Charge	(g/m)	40	40	40	40
	Replacement Technology		YES	YES	YES	YES
	Air Flow	(m3/h)	6060	6180	6180	6180
	Sound Pressure Cool / Heat	(dBA)	49 / 50	51 / 52	51 / 52	51 / 53
	Dimensions Height x Width x Depth	(mm)	1340 x 900 x 320	1340 x 900 x 320	1340 x 900 x 320	1340 x 900 x 320
	Weight	(kg)	93	95	95	95
	Run Current	(Amps)	3.72	15.76	5.42	6.66
	Power Supply		3 phase 400v 50Hz	1 phase 230v 50Hz	3 phase 400v 50Hz	3 phase 400v 50Hz
	Suggested Fused Supply		10	25	16	16

10 PERFORMANCE SPECIFICATIONS

RBC-AHU1 Panel			
Dimensions Height x Width x Depth		(mm)	300 x 300 x 150
Weight		(kg)	10
Power Supply			6 Amps /1 phase 230v 50Hz
Control Relay	Unit	0 volt	On / Off
Control Relay	Remote	0 volt	Lock / Unlock

Accessories	
***** RBC-AMT32E	Wired Remote Controller
***** RBC-AMS41E	Wired Remote Controller inc. 24/7 Timer
TCB-PCNT30TLE	Network Adaptor
RBC-SMIM2	Remote Indicator Module - Cool / Heat / Fan Only
RBC-FDP3-PE	BMS Interface Module
TCB-TC21LE2	Remote Temperature Sensor

*** NOTE** It is necessary to connect a Toshiba wired controller (accessory supplied separately), TCC-Net control or third party controller to terminals RC A+B on RBC-AHU1 to operate the system. RBC-AHU1 will not operate if this connection is not made. It is also necessary to connect a Toshiba wired controller to configure the DN address code settings for Toshiba Digital and Super Digital condensing units.

- The DX Coil must be suitable for **R410A**.
- The counter flow principle must be observed.
- Cooling: Saturated Suction Temperature (evaporating) 7°C
- Heating: Saturated Discharge Temperature (condensing) 44°C
- Target Suction Super Heat 5K
- System Maximum Operating Pressure 4.15MPa
- DX Coil must satisfy Burst Pressure (more than 12.45MPa)

11 R410A REPLACEMENT TECHNOLOGY

Existing piping connection with different diameter gas and liquid line is possible using the criteria detailed below

Liquid Pipe Size in" or mm		1/4 - 6.4 (STD)						3/8 - 9.5 (1-size large)			
Gas Pipe Size in" or mm		3/8 - 9.5 (1-size smaller)		1/2 - 12.7 (STD)		5/8 - 15.9 (1-size larger)		1/2 - 12.7 (STD)		5/8 - 15.9 (1-size larger)	
Maximum Pipe Distance		Length	Pre-charged	Length	Pre-charged	Length	Pre-charged	Length	Pre-charged	Length	Pre-charged
		m	m	m	m	m	m	m	m	m	m
RAV-DI Series 4	SM56*			30	20	30	20	20	10	20	10
RAV-SDI Series 4	SP40*	30	20	30	20	30	20	20	10	20	10
	SP56*			50	20	50	20	20	10	20	10

Liquid Pipe Size in" or mm		1/4 - 6.4 (1-size smaller)				3/8 - 9.5 (STD)						1/2 - 12.7 (1-size larger)			
Gas Pipe Size in" or mm		1/2 - 12.7 (1-size smaller)		5/8 - 15.9 (STD)		1/2 - 12.7 (1-size smaller)		5/8 - 15.9 (STD)		3/4 - 19.1 (1-size larger)		5/8 - 15.9 (STD)		3/4 - 19.1 (1-size larger)	
Maximum Pipe Distance		Length	Pre-charged	Length	Pre-charged	Length	Pre-charged	Length	Pre-charged	Length	Pre-charged	Length	Pre-charged	Length	Pre-charged
		m	m	m	m	m	m	m	m	m	m	m	m	m	m
RAV-DI Series 4	SM80*	20	20	20	20	30	20	30	20	30	20				
	SM110*							50	30	50	30	25	15	25	15
	SM140*							50	30	50	30	25	15	25	15
RAV-DI Series 3	SM160*							50	30	50	30	25	15	25	15
RAV-SDI Series 4	SP80*	30	20	30	20	50	30	50	30	50	30				
	SP110*							75	30	75	30	25	15	25	15
	SP140*							75	30	75	30	25	15	25	15

Liquid Pipe Size in" or mm		1/2 - 12.7 (STD)				5/8 - 15.9 (1-size larger)			
Gas Pipe Size in" or mm		7/8 - 22.2 (1-size smaller)		1 1/8 - 28.6 (STD)		7/8 - 22.2 (1-size smaller)		1 1/8 - 28.6 (STD)	
Maximum Pipe Distance		Length	Pre-charged	Length	Pre-charged	Length	Pre-charged	Length	Pre-charged
		m	m	m	m	m	m	m	m
RAV-DI Series 4	SM224*	70	30	70	30	50	20	50	20
	SM280*	70	30	70	30	50	20	50	20

Common Refrigerants For Existing Plant
R12
R134A
R22
R404A
R407C
R417A

Smaller Pipe Sizes (Performance capacity is reduced due to the effect of gas pipe size being smaller than standard connection)

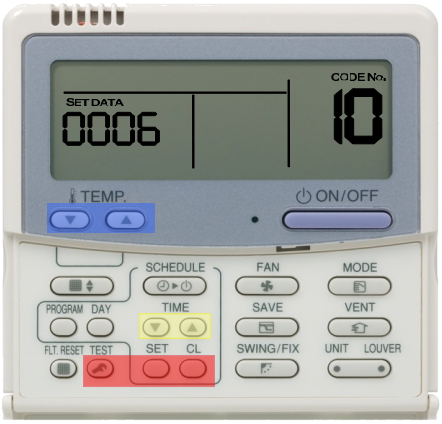
Normal Pipe Sizes

Larger Pipe Sizes

Not Compatible

12 COMMISSIONING CONTROL PANEL

1. Ensure all connections are correctly made and the sensors have been suitably located.
2. Confirm the integrity of the power supply at the outdoor unit and between terminals 1 & 2 at the controller input terminals. 1 is Live and 2 is Neutral.



3. It is necessary to set the system capacity and type via the RBC-AMT32E / AMS41E. The configuration menu is accessed by pressing SET + TEST + CL buttons (indicated Red) for 4 seconds. Item CODE No.10 (two figure is displayed right). SET DATA (four figure displayed left) requires changing from 0001 to 0006 by pressing TIME Up Down buttons (indicated Yellow). Press SET to save configuration. SET DATA value 0006 is the same for all systems.
4. Press TEMP Up and Down buttons (indicated Blue) to select item Code No.11 (two figure displayed right). SET DATA (four figure displayed left) to values detailed in tables below "Digital Inverter" or "Super Digital Inverter" according to condensing unit model type by pressing TIME Up Down buttons (indicated Yellow). Press SET to save configuration.
5. After setting the SET DATA codes press TEST button (indicated Red) SETTING is displayed on the controller for approximately 5 minutes and then normal display resumes.

Digital Inverter

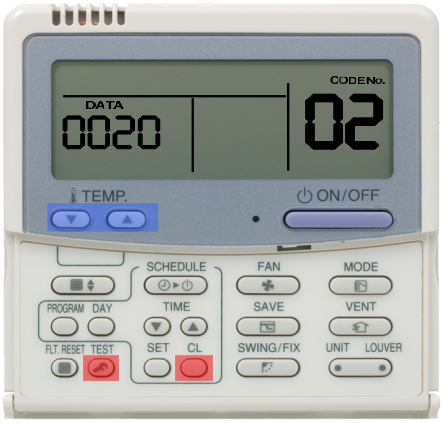
Unit	SM564ATP-E	SM804ATP-E	SM1104APT-E	SM1404ATP-E	SM1603AT-E	SM2244AT8-E	SM2804AT8-E
Value	0009	0012	0015	0017	0018	0021	0023

Super Digital Inverter

Unit	SP404ATP-E	SP564ATP-E	SP804ATP-E	SP1104AT(8)-E	SP1404AT(8)-E	SP1604AT(8)-E
Value	0006	0009	0012	0015	0017	0018

Sensor Connection Confirmation

It is possible to read data from the sensors by accessing the data retrieval menu. Press TEST and CL (indicated Red) for 4 Seconds and use TEMP up and down buttons (indicated Blue) to retrieve the data as shown in the table below.



Code	Outdoor Sensor Data
60	TE Sub-cooled Liquid Temp. (°C)
61	TO Ambient Temp. (°C)
62	TD Discharge Temp. (°C)
63	TS Suction Temp. (°C)
65	THS Inverter Heat Sink Temp. (°C)

Code	Outdoor Data	Code	AHU Sensor Data
6A*	Operation Current (A)	02	TA Return Air Temp. (°C)
70*	Compressor Frequency (Hz)	03	TCJ Coil Liquid Temp. (°C)
F1*	Compressor Run Time (x 100h)	04	TC Coil Vapour Temp. (°C)
*Data for 4 series outdoor units only			

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The information shown in this Technical Book is based on the following data:

- **Nominal capacities are based on Eurovent** - Cooling: indoor air temperature 27°C db/19°C wb, outdoor air temperature 35°C db/24°C wb. Heating: indoor air temperature 20°C db, outdoor air temperature 7°C db
- **The sound pressure levels are based on** - Outdoor units at 1 m distance, indoor units at 1.5 m distance
- **The maximum running current is based on 230 V, 1 phase and 380 V, 3 phase in the cooling mode.**

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